

# Project 2 Final Notes

- Adding noise and not accounting for it places more weight on the measurements than they deserve.
- Code tries to fit the measurements to 0.25K, when they are only good to 5K, leading to the wild oscillations.

- Posterior error is the “theoretical” error on the retrieval. It ONLY depends on the assumed measurement noise, and the (assumed) error on the prior temperature profile (as specified through the noise covariance matrix).

# Two ways to specify prior knowledge

- 1: Use a prior covariance matrix with off-diagonal elements to put in correlations between temperatures of different levels.
- 2: Use a parameterized form of temperature profile that “hard-codes” a shape (and hence inter-layer correlations).

# Example T-profile Parameterization

- $T = T_s - \Gamma_t z$   $(z < z_{tp})$
- $T = T_s - \Gamma_t z_{tp} + \Gamma_s (z - z_{tp})$   $z > z_{tp}$
- 4 parameters:  $x = (T_s, \Gamma_t, \Gamma_s, z_{tp})$

# Comparison of prior types

